Smallpox Phase I Hospital Team Vaccination Seminar

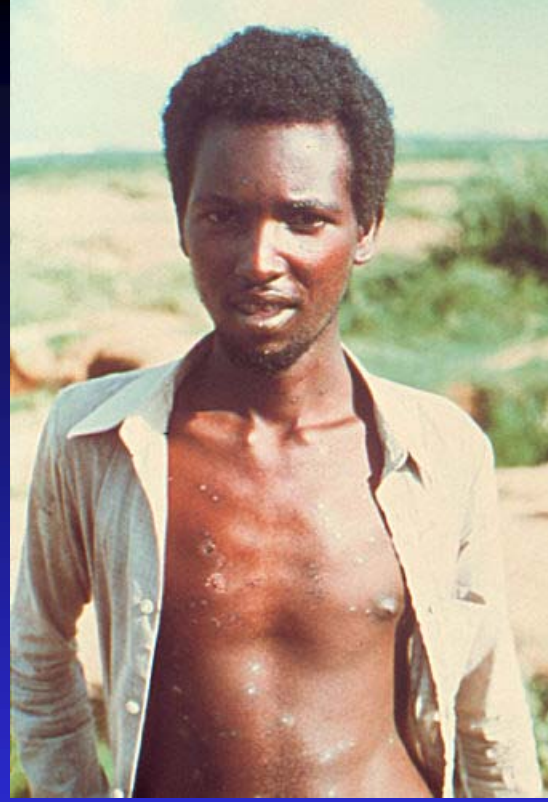
North Dakota Department of Health

Smallpox Overview

Terry L. Dwelle, MD, MPHTM
State Health Officer
North Dakota Department of Health

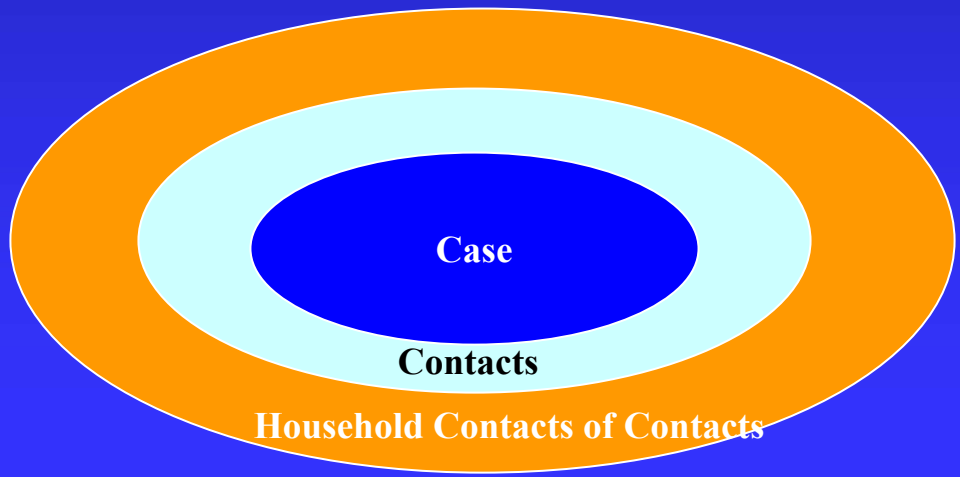
History

- 1977 – Last naturally acquired case in Somalia
- 1978 – Laboratory-related death at the University of Birmingham, England
- 1980 – Global eradication certified by the World Health Organization
- Method of eradication – Ring vaccination, not mass vaccination



Ring Vaccination Concept

- Isolation of confirmed and suspected cases
- Identification, vaccination and surveillance of significant contacts of proven cases
- Vaccination of household contacts of contacts



Smallpox – Basic Facts

- Cause – Variola Virus
- Can infect only humans
- Transmission – Close face to face (generally within 6 feet) via respiratory droplets of a person who has the disease

Smallpox - Disease

- Onset is 12 to 14 days after exposure
- Days 2 to 3 – High fever, bed-ridden, headache and backache
- Days 4 to 5 – Onset of the rash (small bump – blister – pustule – scab)
- Most infectious during the first week of the rash. No longer infectious once the scabs fall off (3 to 4 weeks)
- Death rate is about 30 percent

Smallpox

Smallpox Vaccination

- Live virus vaccine – Vaccinia (this is not the smallpox virus)
- Highly effective in preventing illness or severe disease if given within 3 to 4 days of definite exposure to smallpox

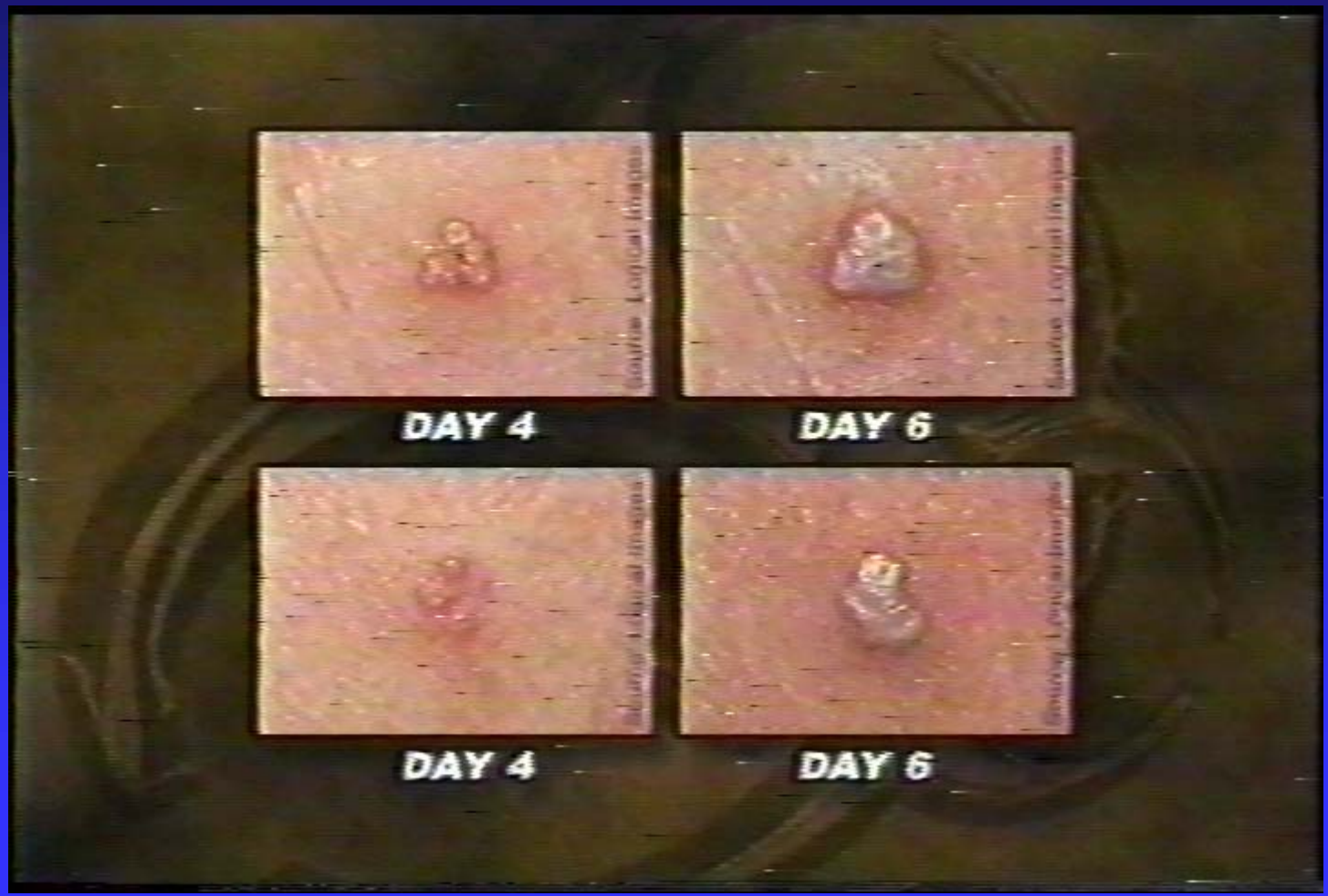
Smallpox Vaccination

- Skin reactions are an indicator that the vaccine was effective (vaccine “take”)
  - 3 to 4 days – Redness and itching
  - 7 to 11 days – Vesicle (blister) develops into a pustule, redness increases
  - 14 to 21 days – Pustule dries, scab forms
  - 21 days – Scabs falls off, leaving a permanent scar
- Commonly see fever and tender, enlarged lymph nodes

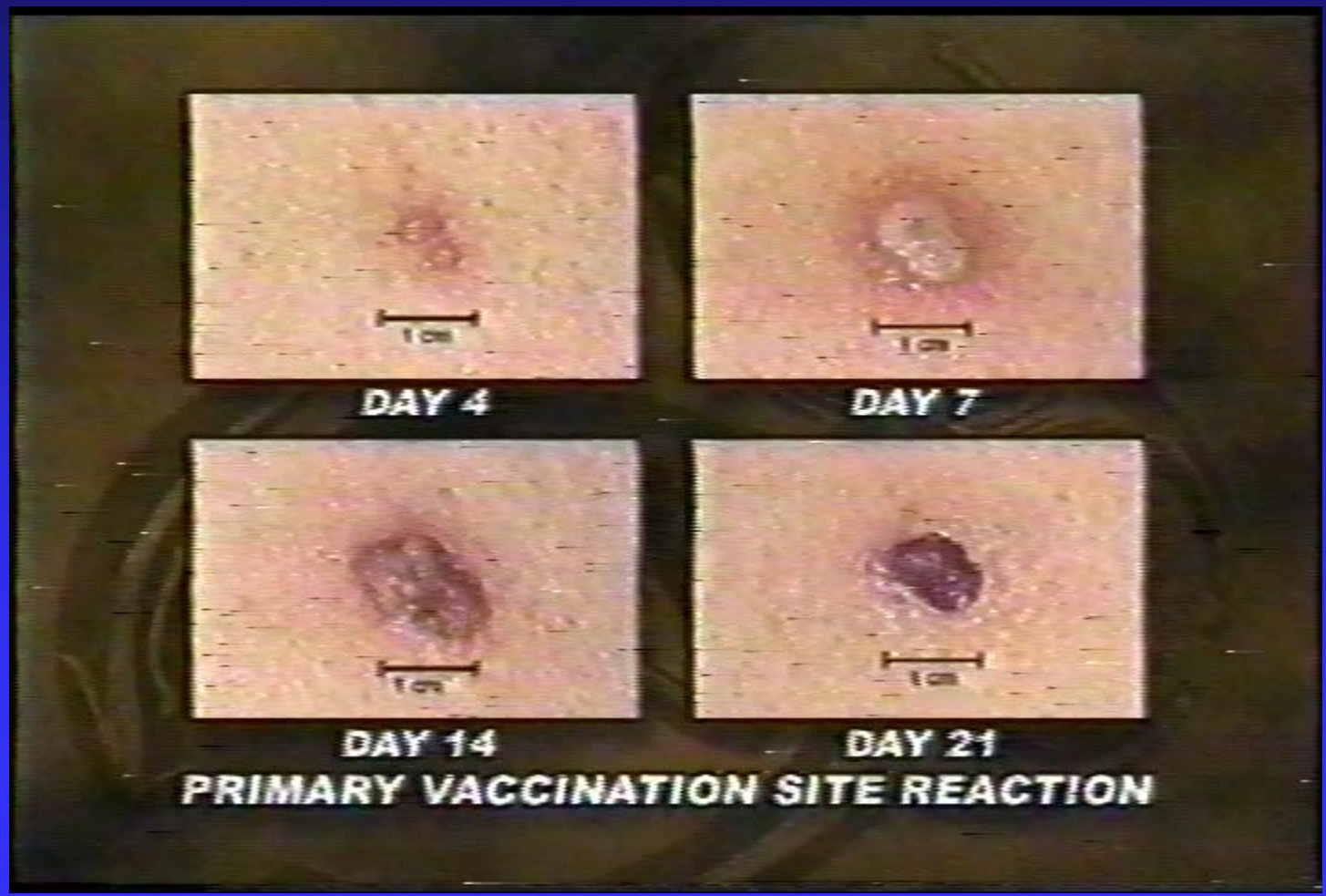
Vaccination – Adverse Reactions

- Death – 1 / million
- Accidental infection of other body part (i.e. eye) – 1 / 2000
- Generalized vaccinia – 1 / 5000
- Eczema vaccinatum – 1 / 26,000
- Post vaccination encephalitis – 1 / 300,000
- Progressive vaccinia – 0.83 / million

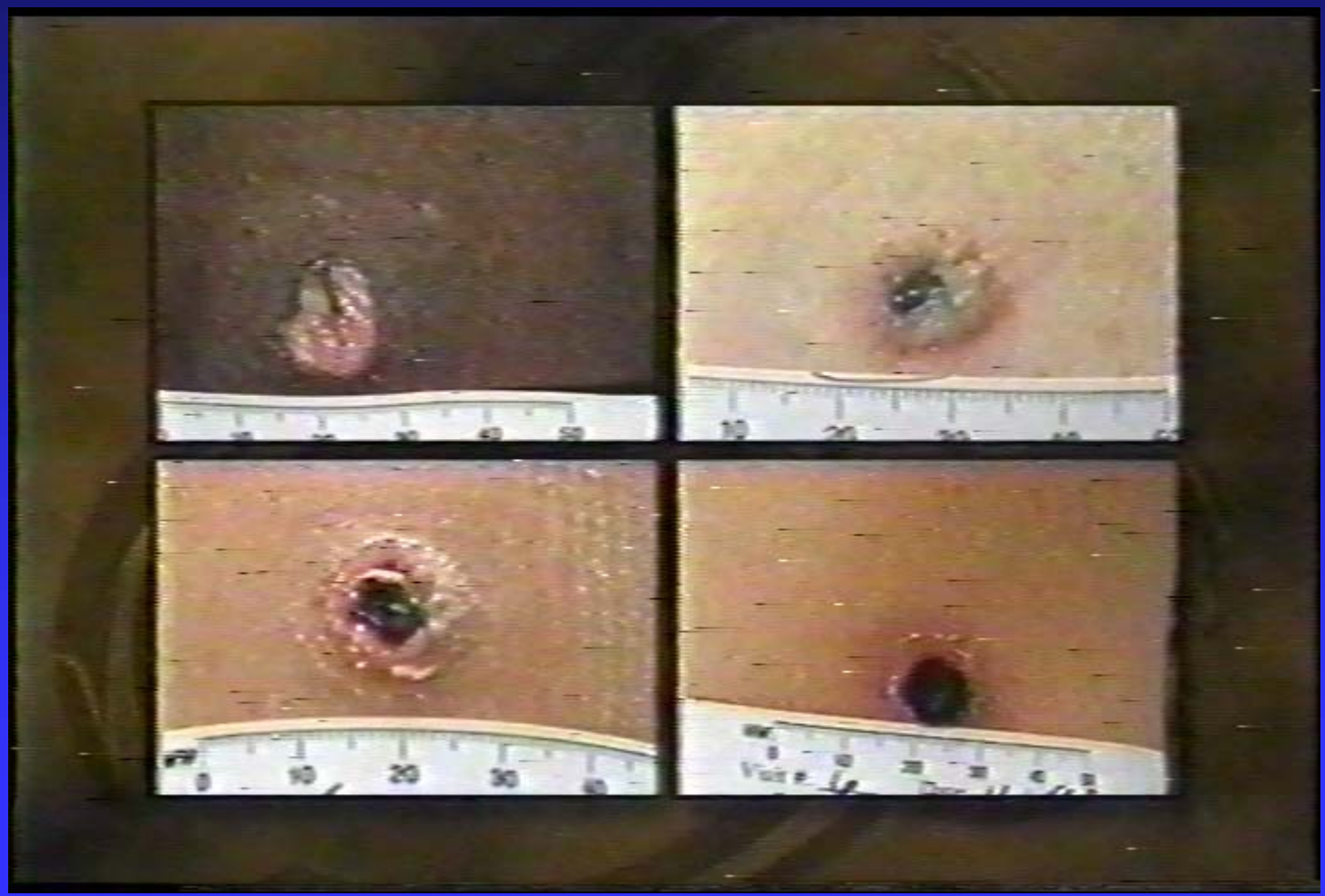
Vaccination Site Progression



Vaccination Site Progression



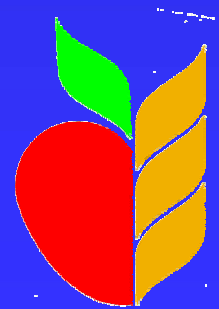
Vaccination Site Progression



Vaccination Site Progression

Smallpox Surveillance and Diagnosis

Larry A. Shireley, MS,MPH
State Epidemiologist
North Dakota Department of Health



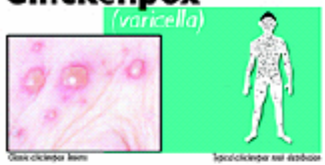
Early Detection

"Atypical" Rash Illnesses

Evaluating Patients for Smallpox

Acute, Generalized Vesicular or Pustular Rash Illness Protocol

Chickenpox (varicella)



Images of Chickenpox (Varicella)

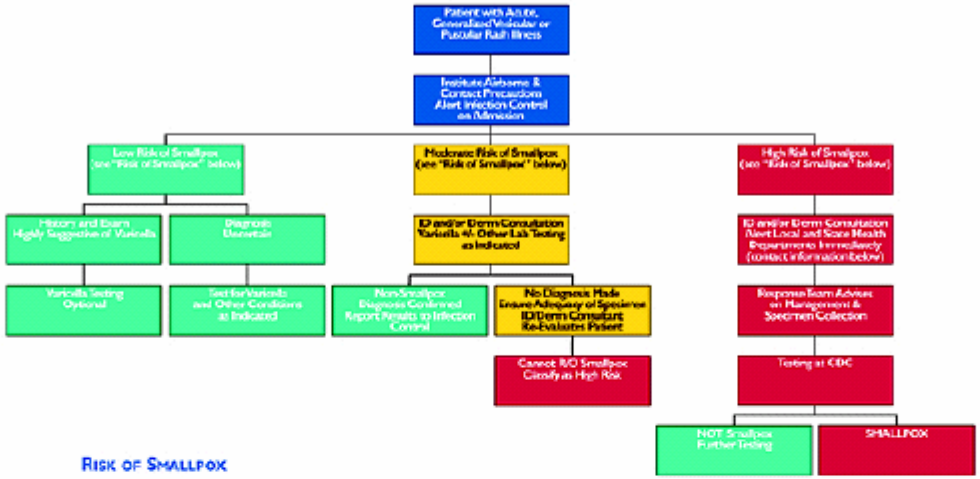
Differentiating Chickenpox from Smallpox

Chickenpox (varicella) is the most likely condition to be confused with smallpox.

In chickenpox:

- No or mild prodrome
- Lesions are superficial vesicles: "dewdrop on a rose petal" (see photo at top)
- Lesions appear in crops: on any one part of the body there are lesions in different stages (papules, vesicles, crusts)
- Centripetal distribution: greatest concentration of lesions on the trunk, fewest lesions on distal extremities. May involve the face/scalp. Occasionally entire body equally affected.
- First lesions appear on the face or trunk
- Patients rarely look or feel toxic
- Rapid evolution: lesions evolve from macules => papules => vesicles => crusts quickly (<24 hours)
- Palms and soles rarely involved
- Patient lacks reliable history of varicella or varicella vaccination
- 50-80% recall an exposure to chickenpox or shingles 10-21 days before rash onset

Photo Credits: Dr Thomas Fleck, Dr Barbara Watson, Dr Scott A. Norton, Dr Patrick Allgeier, World Health Organization, American Academy of Pediatrics, American Academy of Dermatology



Risk of Smallpox

High Risk of Smallpox -> Report Immediately

1. Febrile prodrome (defined below) AND
2. Classic smallpox lesion (defined below & photo at top right) AND
3. Lesions in same stage of development (defined below)

Moderate Risk of Smallpox -> Urgent Evaluation

1. Febrile prodrome (defined below) AND
2. One other MAJOR smallpox criterion (defined below)

OR

1. Febrile prodrome (defined below) AND
2. ≥6 MINOR smallpox criteria (defined below)

Low Risk of Smallpox -> Manage as Clinically Indicated

1. No febrile prodrome

OR

1. Febrile prodrome AND
2. <6 MINOR smallpox criteria (defined below)

There have been no naturally occurring cases of smallpox anywhere in the world since 1977. A high risk case of smallpox is a public health and medical emergency.

Report ALL HIGH RISK CASES immediately (without waiting for lab results) to:

1. Hospital Infection Control _____ ( ) _____-_____
2. _____ health department ( ) _____-_____
3. _____ health department ( ) _____-_____

Major Smallpox Criteria

- **FEBRILE PRODROME:** occurring 1-4 days before rash onset; fever ≥101°F and at least one of the following: prostration, headache, backache, chills, vomiting or severe abdominal pain.
- **CLASSIC SMALLPOX LESIONS:** deep-seated firm/hard, round well-circumscribed vesicles or pustules; as they evolve, lesions may become umbilicated or confluent
- **LESIONS IN SAME STAGE OF DEVELOPMENT:** on any one part of the body (e.g., the face, or arm) all the lesions are in the same stage of development (i.e., all are vesicles or all are pustules)

Minor Smallpox Criteria

- Centrifugal distribution: greatest concentration of lesions on face and distal extremities
- First lesions on the oral mucosa/palate, face, or forearms
- Patient appears toxic or moribund
- Slow evolution: lesions evolve from macules to papules -> pustules over days (each stage lasts 1-2 days)
- Lesions on the palms and soles

Department of Health and Human Services
Centers for Disease Control and Prevention

Smallpox (variola)

Images of Smallpox

Common Conditions That Might Be Confused with Smallpox

Condition	Clinical Clues
Varicella (primary infection with varicella-zoster virus)	Most common in children <10 years; children usually do not have a viral prodrome
Disseminated herpes zoster	Immunocompromised or elderly persons; rash looks like varicella, usually begins in dermatomal distribution
Impetigo (Streptococcus pyogenes, Staphylococcus aureus)	Honey-colored crusted plaques with bullae are classic, but may begin as vesicles; regional not dissemmated rash; patient generally not ill
Drug eruptions	Exposure to medications; rash often generalized
Contact dermatitis	Itching; contact with possible allergens; rash often localized in pattern suggesting external contact
Erythema multiforme minor	Target, "bulls eye", or iris lesions often follow recurrent herpes simplex virus infections; may involve hands & feet (including palms & soles)
Erythema multiforme (incl. Stevens-Johnson Syndrome)	Major form involves mucous membranes & conjunctivae; may be target lesions or vesicles
Enteroviral infection esp. Hand, Foot, and Mouth disease	Summer & fall fever & mild pharyngitis +/- days before rash onset; lesions initially maculopapular but evolve into vesicles; gingivostomatitis; often oral vesicles; peripheral distribution (hands, feet, mouth, or disseminated)
Disseminated herpes simplex	Lesions indistinguishable from varicella; immunocompromised host
Scabies: insect bites (incl. fleas)	Itching is a major symptom; patient is not febrile & is otherwise well
Molluscum contagiosum	May disseminate in immunosuppressed persons

For more information, please go to the CDC website http://www.cdc.gov/ncidod/dpx and http://www.bt.cdc.gov/LiveContactInfo.asp

www.bt.cdc.gov/agent/smallpox/diagnosis/index.asp

Rash Illnesses

- Rule Out Chickenpox (Varicella)
  - Reporting of hospitalized patients
  - Consultation
    - Infectious Disease Physicians
    - Dermatologists
- Consultation/Confirmation
  - Centers for Disease Control and Prevention

Laboratory

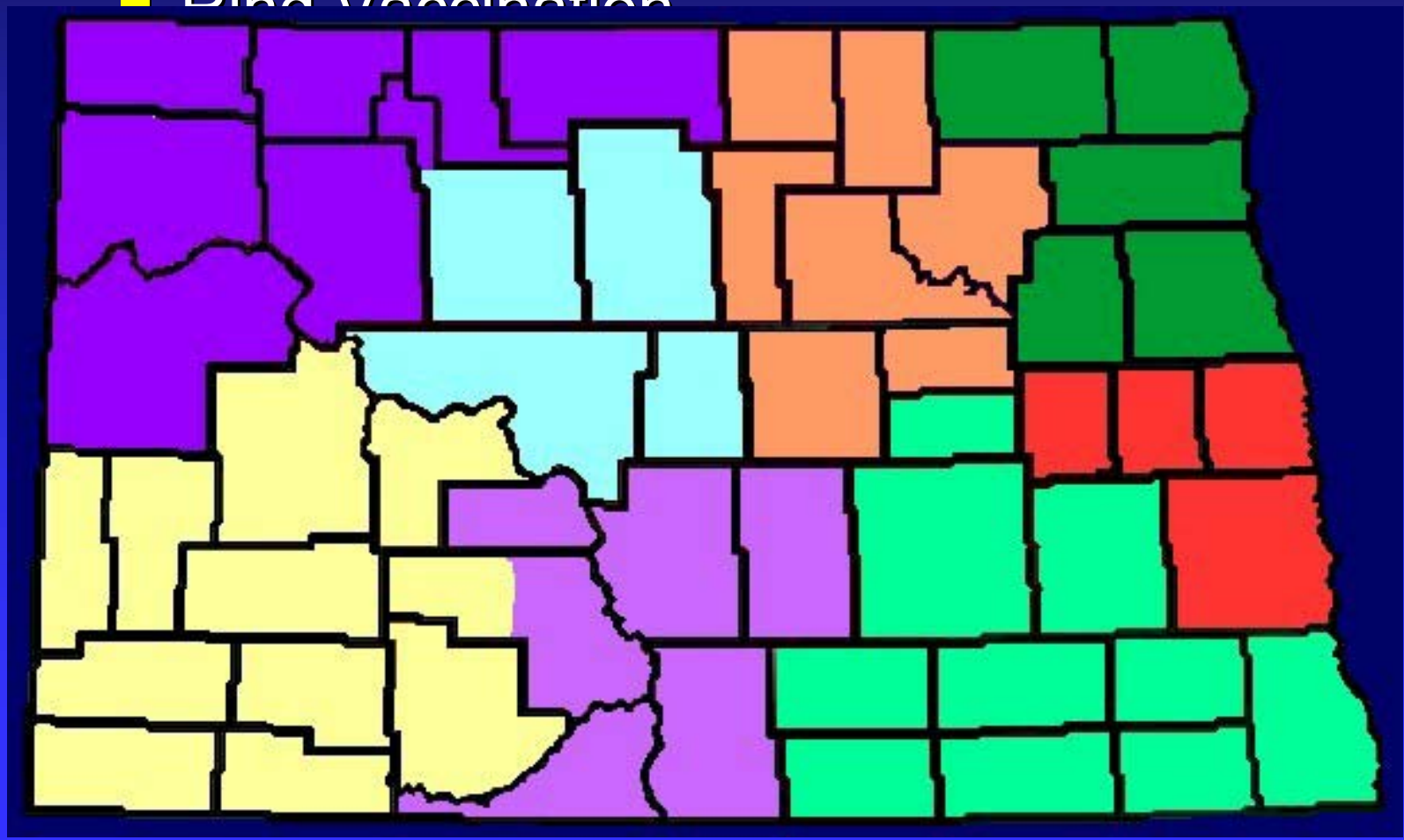
- ND Public Health Laboratory
  - "Rule in Varicella"
    - DFA
    - Real time PCR
  - Pan-Orthopox
    - Real time PCR
  - Vaccinia - Non-variola E9L
    - Real time PCR
- Variola
  - Centers for Disease Control and Prevention
  - Regional Laboratories

Syndromic Surveillance

- Emergency Room
- Regional Ask-A-Nurse
- Others
  - Ambulance “Runs”
  - Pharmaceutical Sales

Case Investigation

- Ring Vaccination



Smallpox Plan Overview

Tim Wiedrich, Director

Bioterrorism Preparedness and Response

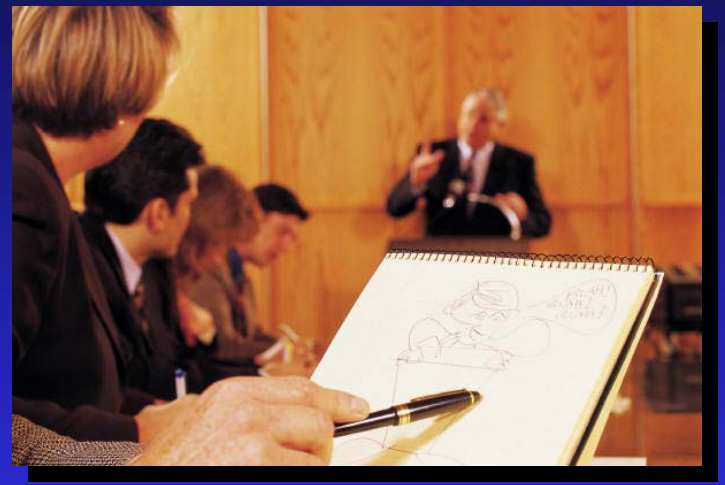
North Dakota Department of Health

Smallpox Plan Categories

- Pre-event
  - Phase I
    - Initial Responders
    - Public Health
    - Hospital
    - About 2,000

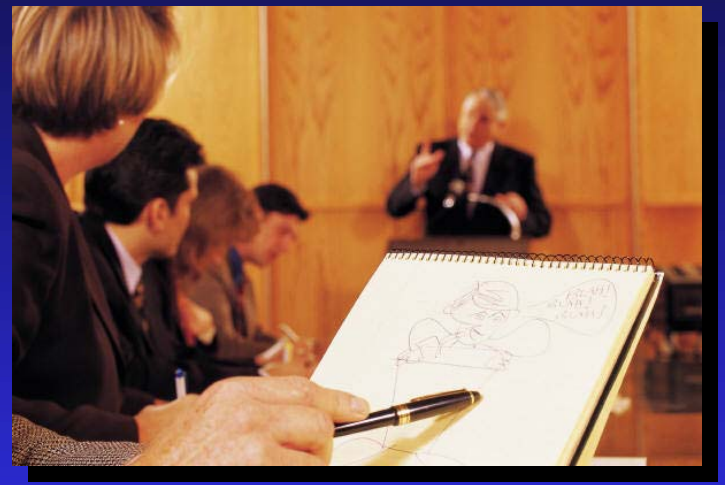
Smallpox Plan Categories

- Pre-event
  - Phase II
    - All Responders
    - Public Health
    - Hospital
    - Clinic/Physician
    - Public Safety
      - Law enforcement
      - Fire
      - EMS



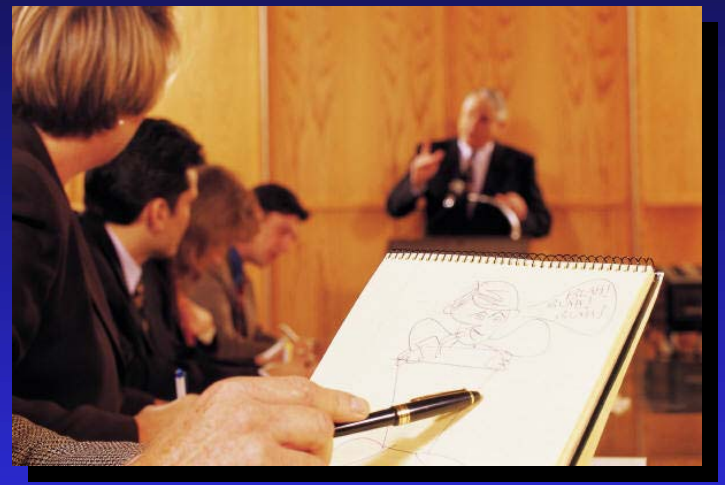
Smallpox Plan Categories

- Pre-event
  - Phase III
    - Public



Smallpox Plan Categories

- Post-event
  - Ring vaccination
  - Mass vaccination



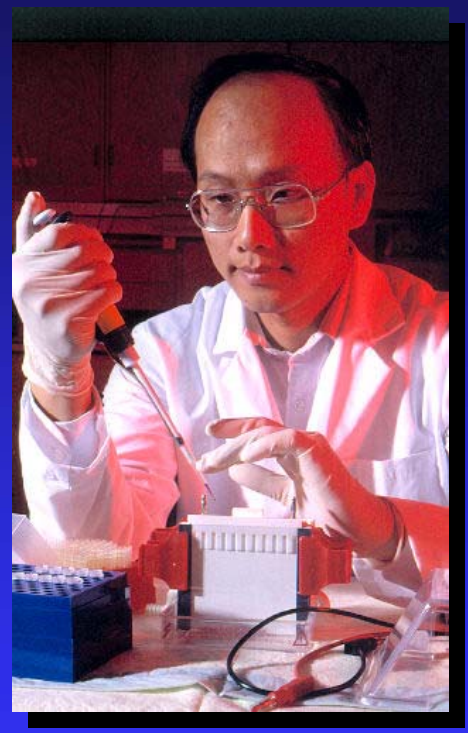
Bioterrorism Regional Planning Areas

Public Health Regional Resources

- Lead Public Health Units
- Bioterrorism Directors
- Field Epidemiologists
- Medical Consultants
- Public Information Officers

Phase I Pre-event Vaccination Clinics

- State Responsibilities
  - Receipt and delivery of vaccine
  - Establishment of regional consultants
  - Data registration
  - Training
  - Public education
- Regional and Local Responsibilities
  - Identification of public & hospital response teams
  - Clinic Planning
    - Site selections
    - Supply acquisitions
    - Staffing
    - Schedule planning
    - Supervision and evaluation



Healthcare Response Teams

Brenda Vossler, RN, CIC
Bioterrorism Hospital Coordinator
North Dakota Department of Health

Purpose of a Healthcare Team

- Provide for the safety of healthcare workers
- Provide immediate quality care to smallpox patients

Selecting Your Healthcare Team

- Consider the services you provide.
- Consider workloads, schedules and vacations.
- Select enough team members to provide care 24/7 for 7-10 days.
- Select staff willing to participate. Vaccination is voluntary.

Composition of Healthcare Team

- ER staff—MDs, RNs, EMTs, Receptionist
- ICU staff—MDs, RNs,
- Medical unit staff—MDs, RNs
- Medical Specialists
- Infection Control
- Respiratory Therapy
- Radiology Techs
- Phlebotomy
- Security
- Housekeeping
- Laundry

Educate Team Members and other Hospital Staff

- Smallpox disease
- Vaccine
- Vaccine contraindications
- Normal “take”
- Adverse reactions
- Resources available at www.cdc.gov

Screen for Contraindications

- Immunosuppression for any reason
- Eczema or atopic dermatitis or history
- Pregnancy or breast feeding
- Household members with above contraindications
- Allergic reaction to previous vaccination or vaccine ingredients
- Moderate or severe illness
- Persons less than 18 years of age

Post-vaccination Site Care

- Cover with gauze and semi-permeable dressing.
- Change dressing every 2-3 days and as needed.
- Evaluator to observe site daily prior to clinical assignment.
- Excessive drainage may exclude staff from clinical assignment.

Administrative Leave and Sick Leave

- CDC recommendations do not require administrative leave.
- Vaccinated staff may be physically unable to work for several days.
- Hospitals must decided what their policy will be.
- Worker's compensation will cover adverse effects and absence > 5 days.

References

- ND Department of Health website at www.health.state.nd.us/healthalert/professionals/. Select “Health Care Institutions”.
- CDC website at www.cdc.gov.
- Regional bioterrorism directors.
- State bioterrorism office 701-328-2270.

Smallpox Communications

Loreeta Leer Frank
Public Information Officer
North Dakota Department of Health

Emergency Communication Response

The NDDoH Office of Public Information supports state and local public health officials in their efforts to protect the public in the event of a public health emergency

Objectives

- To provide the public and the media access to accurate, consistent, comprehensive and timely information
- To minimize, as much as possible, public panic and fears
- To coordinate public information response with other local, state and federal partners

Guiding Principle

The public will need information that will help them minimize their risk

Not Business as Usual

A public health emergency:

- Triggers a level of public interest and media inquiry that requires a response beyond normal operations and resources.
- Requires a significant diversion of department staff from regular duties.

Recent Events

- Anthrax concerns ~ 2001
- West Nile virus ~ 2002

Smallpox Communication Plan

Within 30 minutes of notification of a smallpox case:

- All media calls to NDDoH routed to Office of Public Information

Smallpox Communication Plan

- State health officer or designee will act as official spokesperson for the department
- News conference held as soon as possible
- Any subsequent news conferences held at consistent, central location

Smallpox Communication Plan

- Regular briefings held as warranted
- If few new details, then news releases and news conferences as necessary
- Updates posted to NDDoH website at least daily
- Public health experts will be available for interviews with media

Confidentiality Issues

- By law, NDDoH cannot release patient-identifying information
  - Ex. – West Nile virus

Confidentiality Issues

- During smallpox event, confidentiality issues will be balanced with public safety
  - Smallpox cases will be identified by county
  - Condition of cases will be described
  - Name, age and gender not released

Emergencies Are Media Events

- Emergency response would be hampered if media not involved
  - People rely on media for up-to-date information during an emergency
  - Media relay important protective actions for the public
  - Media know how to reach their audiences and what their audiences need

Public Health's Goal in Emergency Response

To efficiently and effectively reduce and prevent illness, injury and death and to return individuals and communities to normal

Contact Information

Loreeta Leer Frank, public information officer
701.328.1665
rfrank@state.nd.us

Patience Hurley, public information coordinator
701.328.4619
phurley@state.nd.us

Questions?

During this Live program

Call 701-328-2614

or

Send E-mail

Following the Live Program

Call 701-328-2270 or Send E-mail to twiedric@state.nd.us

North Dakota Department of Health

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